

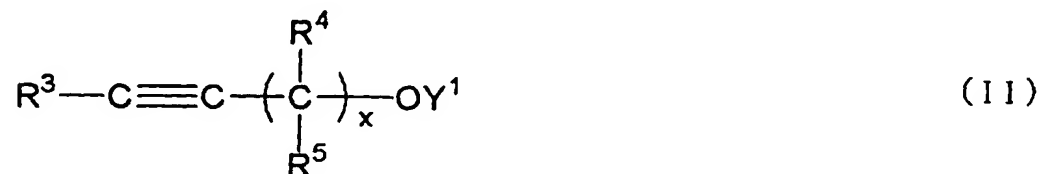
IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A non-aqueous electrolytic solution comprising an electrolyte salt in a non-aqueous solvent for a lithium secondary battery, wherein the non-aqueous electrolytic solution further contains a vinylene carbonate compound represented by the formula (I) in an amount of 0.01 to 10 wt.%, and at least one alkyne compound represented by the formula (II), (III), (IV), (V), ~~(VI), or (VII)~~ or (VI) in an amount of 0.01 to 10 wt.%:



in which each of R¹ and R² independently is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

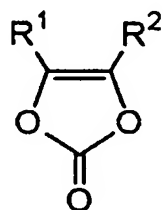


in which each of R³ to R⁵ independently is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms, or R⁴ and R⁵ are combined with each other to form a cycloalkylene group having 3 to 6 carbon atoms; x is 1 or 2; and Y¹

IN THE CLAIMS:

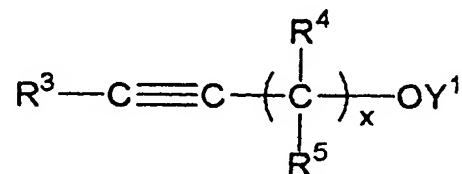
Please amend the claims as follows:

1. (Currently Amended) A non-aqueous electrolytic solution comprising an electrolyte salt in a non-aqueous solvent for a lithium secondary battery, wherein the non-aqueous electrolytic solution further contains a vinylene carbonate compound represented by the formula (I) in an amount of 0.01 to 10 wt.%, and at least one alkyne compound represented by the formula (II), (III), (IV), (V), ~~(VI), or (VII)~~ or (VI) in an amount of 0.01 to 10 wt.%:



(I)

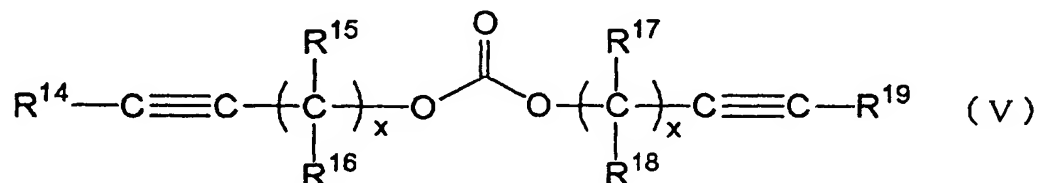
in which each of R¹ and R² independently is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;



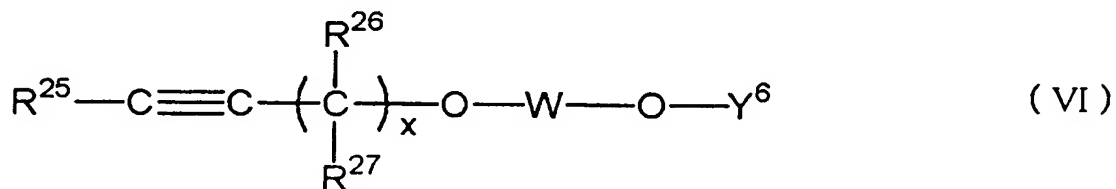
(II)

in which each of R³ to R⁵ independently is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms, or R⁴ and R⁵ are combined with each other to form a cycloalkylene group having 3 to 6 carbon atoms; x is 1 or 2; and Y¹

or an aryl group having 6 to 12 carbon atoms, or R¹⁰ and R¹¹ or R¹² and R¹³ are combined with each other to form a cycloalkylene group having 3 to 6 carbon atoms; x is 1 or 2; Y⁴ is -COOR²³, -COR²³, or -SO₂R²³, wherein R²³ is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms; and Y⁵ is -COOR²⁴, -COR²⁴, or -SO₂R²⁴, wherein R²⁴ is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms;

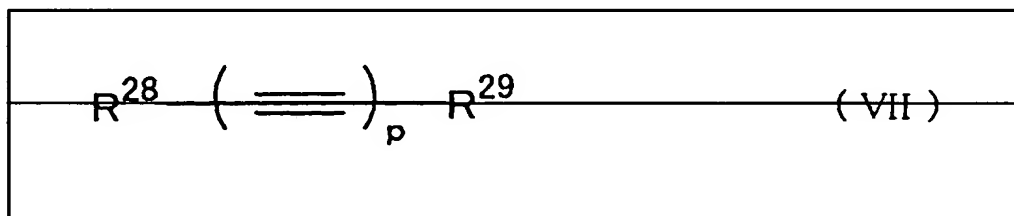


in which each of R¹⁴ to R¹⁹ independently is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms, or R¹⁵ and R¹⁶ or R¹⁷ and R¹⁸ are combined with each other to form a cycloalkylene group having 3 to 6 carbon atoms; and x is 1 or 2;



in which each of R²⁵ to R²⁷ independently is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms,

an aryl group having 6 to 12 carbon atoms, or an aralkyl group having 7 to 12 carbon atoms, or R^{26} and R^{27} are combined with each other to form a cycloalkylene group having 3 to 6 carbon atoms; x is 1 or 2; W is sulfinyl, sulfonyl, or oxalyl; and Y^6 is an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 2 to 12 carbon atoms, an alkynyl group having 2 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an aryl group having 6 to 12 carbon atoms, or an aralkyl group having 7 to 12 carbon atoms.



~~in which R^{28} is an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms; R^{29} is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, or an aryl group having 6 to 12 carbon atoms; and p is 1 or 2.~~

2. (Original) The non-aqueous electrolytic solution of claim 1, wherein the non-aqueous electrolytic solution contains the vinylene carbonate compound in an amount of 0.05 to 5 wt. %.

3. (Original) The non-aqueous electrolytic solution of claim 1, wherein the non-aqueous electrolytic solution contains the vinylene carbonate compound in an amount of 0.1 to 3 wt. %.

4. (Original) The non-aqueous electrolytic solution of claim 1, wherein the non-aqueous electrolytic solution contains the alkyne compound in an amount of 0.05 to 5 wt.%.

5. (Original) The non-aqueous electrolytic solution of claim 1, wherein the non-aqueous electrolytic solution contains the alkyne compound in an amount of 0.1 to 3 wt.%.

6. (Original) The non-aqueous electrolytic solution of claim 1, wherein the vinylene carbonate compound is vinylene carbonate.

7. (Currently Amended) The non-aqueous electrolytic solution of claim 1, wherein the alkyne compound is 2-propynyl methyl carbonate, 2-propynyl methanesulfonate, 2-butynylene bis(methyl carbonate), 2-butynylene bis(methanesulfonate), 2,4-hexadiynylene bis(methyl carbonate), di(2-propynyl) carbonate, di(2-propynyl) sulfite, di(2-propynyl) oxalate, ~~phenylacetylene~~, ethyl 2-propynyl oxalate, 2-propynyl formate, 2-butynylene diformate or 2,4-hexadiynylene diformate.

8. (Original) The non-aqueous electrolytic solution of claim 1, wherein the non-aqueous electrolytic solution further contains an aromatic compound in an amount of 0.1 to 5 wt.%, said aromatic compound being selected from the group consisting of cyclohexylbenzene, a fluorocyclohexylbenzene compound, biphenyl, terphenyl, diphenyl ether, 2-fluorophenyl phenyl ether, 4-fluorophenyl phenyl ether, fluorobenzene, difluorobenzene, 2-fluorobiphenyl, 4-fluorobiphenyl, 2,4-difluoroanisole, tert-butylbenzene, 1,3-di-tert-butylbenzene, 1-fluoro-4-

tert-butylbenzene, tert-pentylbenzene, tert-butyl biphenyl, tert-pentyl biphenyl, a partially hydrogenated o-terphenyl, a partially hydrogenated m-terphenyl and a partially hydrogenated p-terphenyl.

9.(Original) The non-aqueous electrolytic solution of claim 1, wherein the non-aqueous electrolytic solution further contains a mixture having a weight ratio of 50:50 to 10:90 in a total amount of 0.1 to 5 wt.%, said mixture being selected from the group consisting of a mixture of biphenyl and cyclohexylbenzene, a mixture of cyclohexylbenzene and tert-butylbenzene, a mixture of cyclohexylbenzene and tert-pentylbenzene, a mixture of biphenyl and fluorobenzene, a mixture of cyclohexylbenzene and fluorobenzene, a mixture of 2,4-difluoroanisole and cyclohexylbenzene, a mixture of cyclohexylbenzene and 1-fluoro-4-tert-butylbenzene, a mixture of cyclohexylbenzene and a fluorocyclohexylbenzene compound, a mixture of a fluorocyclohexylbenzene compound and fluorobenzene, and a mixture of 2,4-difluoroanisole and a fluorocyclohexylbenzene compound.

10.(Original) A lithium secondary battery comprising a positive electrode, a negative electrode and a non-aqueous electrolytic solution, wherein the positive electrode comprises lithium mixed oxide, wherein the negative electrode comprises a material capable of absorbing and releasing lithium, and wherein the non-aqueous electrolytic solution is the solution defined in claim 1.

11.(Original) A lithium secondary battery comprising a positive electrode, a negative electrode and a non-aqueous electrolytic solution, wherein the

positive electrode is a positive electrode composition layer having a density in the range of 3.2 to 4.0 g/cm³ provided on aluminum foil, said positive electrode layer composition layer comprising lithium mixed oxide, and wherein the non-aqueous electrolytic solution is the solution defined in claim 1.

12. (Original) A lithium secondary battery comprising a positive electrode, a negative electrode and a non-aqueous electrolytic solution, wherein the negative electrode comprises a negative electrode composition layer having a density in the range of 1.3 to 2.0 g/cm³ provided on copper foil, said negative electrode layer composition layer comprising a material capable of absorbing and releasing lithium, and wherein the non-aqueous electrolytic solution is the solution defined in claim 1.

13. (Original) A lithium secondary battery comprising a positive electrode, a negative electrode and a non-aqueous electrolytic solution, wherein the positive electrode comprises a positive electrode composition layer having a density in the range of 3.2 to 4.0 g/cm³ provided on aluminum foil, said positive electrode layer composition layer comprising lithium mixed oxide, wherein the negative electrode comprises a negative electrode composition layer having a density in the range of 1.3 to 2.0 g/cm³ provided on copper foil, said negative electrode layer composition layer comprising a material capable of absorbing and releasing lithium, and wherein the non-aqueous electrolytic solution is the solution defined in claim 1.